SECTION 3 – AFFECTED ENVIRONMENT

PROJECT AREA DESCRIPTION

The project area is within the Grand Calumet River system, which embraces the southern shore of Lake Michigan. The project locale is within Lake County, Indiana (Plate A). The City of East Chicago has a Sanitary District on the north side of the river, just to the west of the junction with the Indiana Harbor Canal. A 730-foot long channel that discharges the treated water back to the Grand Calumet River is part of the Sanitary District. The discharge channel is approximately 730 feet long (600 feet will be restored) and 40 feet wide. The west bank, which is directly adjacent to the discharge channel, consists of a 1:1 sloped flood bank adjacent to a level field with an area of approximately 2.2 acres (Plate D).

SEDIMENT QUALITY

The discharge channel sediment sampling conducted in Spring 2001 revealed sediments similar to those found throughout the Grand Calumet River/Indiana Harbor Canal system: viscous, oily, fine-grained material with elevated levels of PCBs and PAHs. The results of this investigation are best documented in the HTRW report included in Appendix I of this report. The contaminated sediment in the channel is the most significant barrier to the development of a healthy ecosystem in the discharge channel. The soil of the banks is not of this material, but of clean soil with bottles and inert debris.

WATER QUALITY

The source of water for the drainage channel unnaturally originates from the discharge of the East Chicago Sanitary District. This water is of great clarity and relatively little nutrients. The relatively stable flows have provided lotic conditions for stream fishes and aquatic insects to exist in a very hostile river system. One of the main reasons that aquatic organisms can survive within the channel is the fact that halide substances such as chlorine or fluorine are not used to disinfect treated water, but instead ultra violets lighting systems are used to neutralize harmful bacteria. Although unnatural, this channel may be classified as a limited resource in terms of its biological integrity. The limiting factor here is habitat and substrate, not water quality.

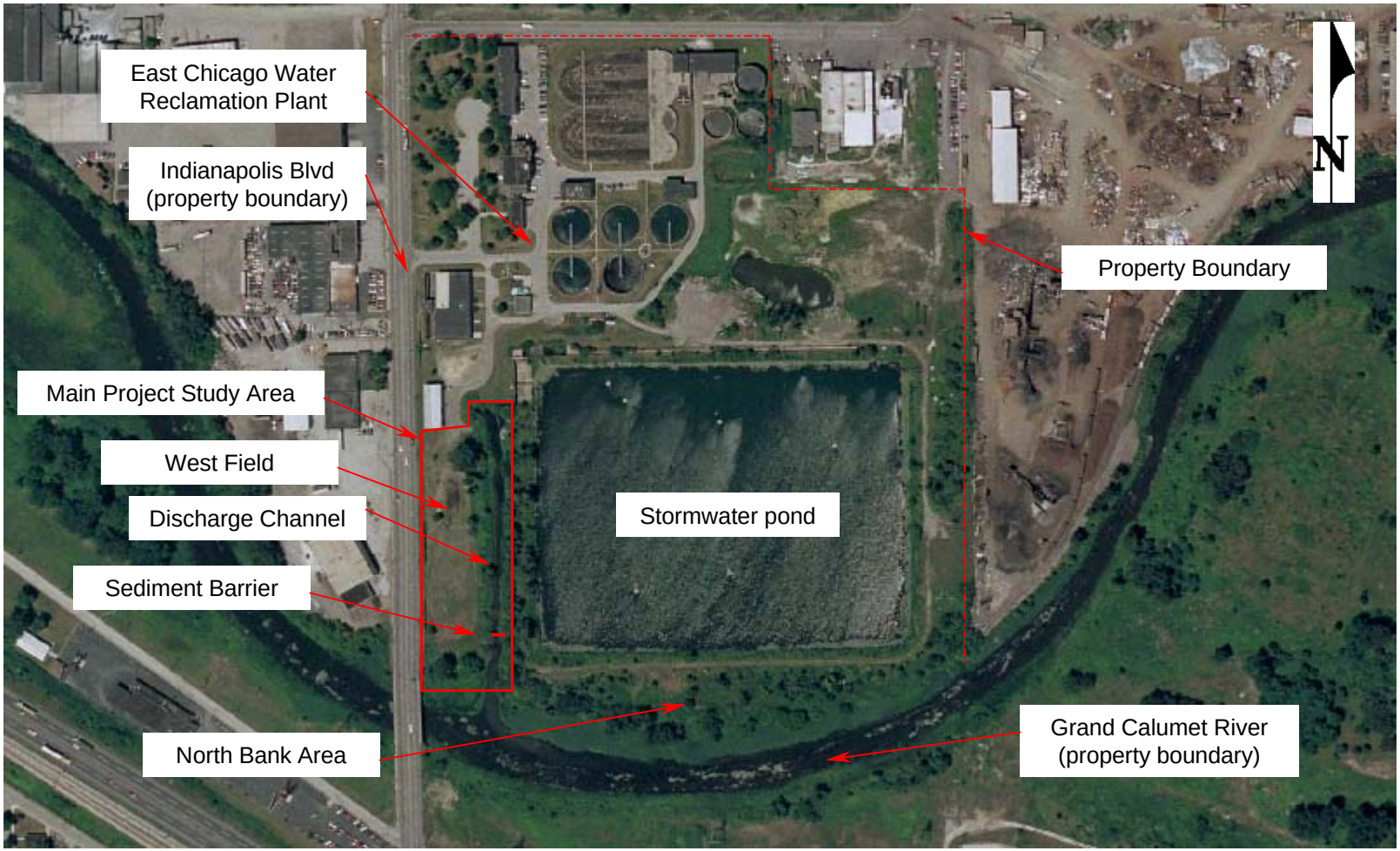
The flow in the Grand Calumet River and Indiana Harbor Canal is composed almost entirely of discharges from resident industries. The strict control of NPDES permits from these dischargers over the past 20 years has resulted in a significant improvement in water quality. Due to improved water quality, the biological community of fishes has shown improvement both in diversity and population though the contaminated sediments remain a barrier to a full return to form.

CURRENT CONDITIONS

Stream

The length of the discharge channel from the “headwaters” to the confluence of the Grand Calumet is approximately 800-feet and averages 1 – 2 feet in depth. The substrate of the immediate headwater area consists of an under layer of riprap, sand, gravel and detritus, in which aquatic macrophytes are growing. Approximately 100-feet downstream is a shallow riffle consisting of large and unnatural riprap. A short distance past this riffle there appears to exist a long sandy run; however, directly beneath the thin layer of sand is a layer of contaminated sediment that ranges from a half foot to five feet deep.

Plate D: East Chicago Project Site



Banks

The banks of the creek for the most party are low quality, non-native plant species, both woody and herbaceous. In the east part of the "headwater" section, there is a cement weir, which allows for storm overflow to discharge into the creek. This discharge falls onto a concrete slab that is about 25-feet long and is in contact with the discharge channel.

Grass Area

To the west of the discharge channel, there is a vacant area that for the most part is mowed turf grass. The un-mowed sections consist of low quality and non-native plant species. The area has potential for landscaping with prairie and savanna plant species.

AQUATIC COMMUNITIES

On 11 May 2001, 10 fish species were collected from the discharge channel through means of electro-fishing. All of the fish collected are considered to be tolerant species. The most abundant are the non-native fish followed by the native Cypriniformes. Fish that were not collected but are confirmed as present are the native smallmouth bass (*Micropterus dolomieu*), and Chinook salmon (*Oncorhynchus tshawytscha*), which are native to the Pacific Northwest but are stocked annually by the Indiana DNR.

The water quality in the discharge channel is of sufficient quality to support most native fish species. With this, aquatic habitat improvements would increase the success of the present species and would open up an opportunity for introducing and attracting other native species of fish, crayfish, mussels, amphibians and reptiles.

Table 4. Fish species and number collected on 11 May 2001 (20min).

Species	**Common Name**	**Number**
Cyprinus carpio	carp	8
Carassius auratus	goldfish	48
Notemigonus crysoleucas	golden shiner	1
Pimephales notatus	bluntnose minnow	37
Pimephales promelas	fathead minnow	3
Catostomus commersonii	white sucker	26
Lepomis cyanellus	green sunfish	3
Lepomis macrochirus	bluegill	2
Lepomis gibbosus	pumpkinseed	1
Neogobius melanostomus	round goby	62
n=10		**191**

WETLANDS

Currently, there are no hydrological functioning wetlands within the project area. Historically, this area consisted of the vast and sluggishly flowing wetland known as the Grand Calumet River. Due to extreme anthropogenic modifications of filling and draining, no wetland remnants were left at the project site.

THREATENED, AND ENDANGERED SPECIES

The state endangered Black-crowned night-heron (*Nycticorax nycticorax*) has been observed foraging in the East Chicago Sanitary District discharge channel. The following description was derived from the New Jersey Fish and Wildlife Service.

Description

The black-crowned night-heron is a stocky, medium sized, black, gray and white wading bird. In comparison to other egrets and herons, the legs and neck of the night-heron are relatively short. Adult black-crowned night-herons are distinct, with a black back and crown, gray hind neck and wings, and a white cheek and abdomen. In breeding plumage, long white streamers extend from the crown down the back beyond the neck. The bill, which is black in adults, is thick, stout, and spear-shaped. The legs are greenish-yellow, but turn pink in breeding adults. Eye color changes from yellow in juveniles to red in adults. In flight, the toes extend beyond the tail. Although their body shape is similar, the plumage of juvenile black-crowned night-herons is quite different from that of adults. Juveniles are buff below with brown streaking and brown above with buff-white markings. The bill is grayish-yellow at the base with a dark tip. Adult plumage is acquired by two years of age. Black-crowned night-herons are similar in appearance to yellow-crowned night-herons (*Nyctanassa violacea*), especially in juvenile plumage.

Habitat

In the Grand Calumet Region, scrub/shrub, marshes, ponds and stream corridors serve as nesting, roosting, and foraging habitats for black-crowned night-herons. Rookeries may be located in wooded swamps, coastal dune forests, vegetated dredge spoil islands, scrub thickets, or mixed phragmites (*Phragmites communis*) and cattail (*Typha* spp.) marshes that are in close proximity to water. Black-crowned night-herons avoid nesting at exposed sites that offer little cover. Black-crowned night-herons nest in forested or scrubby habitats containing vegetation of various heights. Maximum heights of vegetation at local colonies range from 1.5 to 12 m (4.9 to 39.4 ft). Within these habitats, nests are located, on average, 0.19 to 3.95 m (0.6 to 13 ft) above the ground. When nesting in mixed-species colonies with low vegetation height, black-crowned night-herons tend to nest closer to the ground than other species. Similarly, when in mixed-species colonies, black-crowned night-herons tend to nest nearby other black-crowned night-herons due to their similar habitat preferences. Black-crowned night-herons forage in marshes and along the edges of ponds and creeks.

ARCHAEOLOGICAL AND HISTORIC PROPERTIES

Land Use

Before 1890 - In the early nineteenth century the eastern portion of the Grand Calumet flowed east whenever its eastern outlet (at present Marquette Park in Gary) was open. As late as 1869 (when the state-line packing plant opened at Hammond) the Grand Calumet was probably relatively unpolluted; the region was only sparsely populated, and there was no industrial activity at the future site of East Chicago. Before about 1890, the project area was marsh, open water, and sand dunes.

Industrial Development - Between 1890 and 1910 the East Chicago area was transformed by a remarkable concentration of industries, including foundries, railroad-car fabricators, steel mills, chemical plants, non-ferrous foundries (lead, aluminum, copper), a soap factory, and oil refineries. The Grand Calumet River was polluted by the industries, and by untreated sewage (industrial and municipal); none of the communities along the river had any form of sewage treatment before the 1920s.

Canal and River - Construction of the Calumet Branch of the Indiana Harbor Canal began in 1903. The reach south of Columbus Drive was dug during 1908-1912; a 25 February 1910 article in the *Lake County Times* (Hammond, IN) declared that water in the Grand Calumet had dropped by at least 2 feet since the opening of the Indiana Harbor Canal. The east reach of the Grand Calumet River (east of Indianapolis Boulevard) has never been dredged by the Federal government; the same is true of the Calumet Branch of the Indiana Harbor Canal south of 141st Street (Columbus Drive).

Sewage Treatment - Before construction of its plant in 1945, East Chicago had no sewage treatment of any kind. In 1945 the plant provided primary treatment and aeration; this was apparently satisfactory until 1968, when the plant began to accept industrial sewage. The present system dates to April 1989, and involves pre-treatment, bar-screens, grid chamber, oxygen ditch, 5 circular secondary clarifiers, 6 sand filters, and ultra-violet disinfection. The plant discharges into the Grand Calumet east of Indianapolis Boulevard.

Industrial Sites

The earliest major industries on the Grand Calumet in East Chicago appear to have been the Graver Tank Car Works and Grasselli Chemical Company, both established in the early 1890s. East Chicago industries during 1895-1930 included the Bates Expanded Steel Truss Company, Goldschmidt Detinning Company, Grasselli Chemical Company (possibly the same location as Du Pont de Nemours), Graver Tank Works, International Lead Refining, Superheater Company, and United States Reduction Company.

There is a notable concentration of industrial sites on the river around Indianapolis Boulevard, and on the canal between the river and Columbus Drive. Several industries (and individual firms in some cases) have operated along the Grand Calumet and canal for 50 to 100 years. These persistent industries included the Bates Expanded Steel Truss Company (open by 1911, closed sometime before 1989), Union Tank Car Company (opened after 1931, operating in 1993), Grasselli Chemical Company (established 1892, operating as Du Pont in 1996), Shell refinery at Roxana Marsh (opened 1926), Metal Recovery Industries (a detinning site during 1917-1996), U.S. Lead Refining (smelting from 1905 to 1989), and U.S. Reduction Company (aluminum foundry, opened 1912, still operating in 1996).

Ecosystem Restoration Site

Before 1890 the project site was part of the complex of beach ridges, ponds, and marshes bordering the Grand Calumet River. Between 1890 and 1959 the surrounding landscape was drastically altered by the construction of railroads, canals, highways, and industrial plants, and by relocation of portions of the channel of the Grand Calumet River.

The East Chicago sewage treatment plant was built in 1945; the current narrow discharge channel was cut between 1968 and 1991(in a wetland, possibly a wider ditch excavated between 1945 and 1953).

The canal, river, and nearby remnant wetlands do not contain intact or significant archaeological material.

The surrounding area may contain structures of historical significance (particularly pre-WWII drawbridges and industrial plants), but such structures would not be affected by proposed ecosystem restoration measures. Bridges near the project area include the Indianapolis Boulevard bridge (ca. 1935) over the Grand Calumet River; the E J & E Railroad bridge (post-1900) over the canal; the Indiana Harbor Belt Railroad bridge (post-1900) over the canal; and the 151st Street bridge (post-1900) over the canal.

SOCIAL SETTING

Population, Income, Housing

The current population of East Chicago is about 32,400; that figure is less than the city's population of 1920, and reflects the industrial and economic decline of the Calumet region since the 1970s. East Chicago's population is about 52% Hispanic and about 36% African American.

Median household income is about $26,538; income per capita is about $13,517. Median value for owner-occupied housing units is about $35,600; about 3% of the city's housing stock was built after 1980.

Community History

In late 1887 the first subdivision at East Chicago was plotted; the town was incorporated in 1893; there were 1255 inhabitants in 1890 and 3411 in 1900. The owners of the Standard Steel and Iron Company and the Chicago & Calumet Terminal Belt Line Railroad established the city. By 1901 the city's population was 19,098. In 1901 Inland Steel came to East Chicago, attracting a steady influx of European immigrants (Scots, Welsh, Irish, English, and German) until 1914.

During WWI the need to increase steel production attracted workers from Canada, Mexico, and the southern United States. In 1920 the city's population was nearly 35,000; in 1930 the city's population was 50,000. Because so much of the city's area was occupied by railroads and industrial plants, little space remained for additional residents. During WWII, increased demand for steel attracted workers from the southern states and Puerto Rico. In 1960 East Chicago's population was at its all-time high of about 58,000; of that number, about 24% were African American and about 16% Hispanic.

By 1980 the city's population had fallen to under 40,000; the current population (reflecting the industrial and economic decline of the Calumet region) is about 32,400 (less than the population of 1920).

The Indiana Harbor Canal and the switching yards of the Indiana Harbor Belt Line Railroad divide the city into two parts. West of the canal/rail yard barrier is the area of original settlement, known as "East Chicago"; east of the barrier (adjacent to Lake Michigan and the former Inland/LTV steel complex) is the area known as "Indiana Harbor". Until the late 1970s, East Chicago had two flourishing shopping districts (one on the Indiana Harbor side, the other on the East Chicago side); both are largely vacant, with shuttered storefronts.